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General Notes.

PETROGRAPHY.¹

Composite Dykes on Arran.—Professor Judd² describes a number of “composite” dykes on the Island of Arran, in which the well-known “Arran pitchstone” and a glossy augite-andesite occupy different portions of the same fissure, either rock appearing in the center of the dyke, with the other on one or both of its peripheries, or the one rock cutting irregularly through the other. The relations of the rocks indicate that there was no regular sequence in the intrusion, the pitchstone having been intruded sometimes before, sometimes after the andesite. Each rock contains fragments of the other (in different dykes), and the two rocks are always separated by a sharp line of demarkation. The andesite is a basic rock containing about 56 per cent of silica, while the pitchstone is a pantellerite with 75 per cent of SiO_2 or an augite-enstatite-andesite with 66 per cent of SiO_2 and 4.13 per cent K_2O . The andesite is well characterised. It passes into a tholeiite with intersertal structure, by a decrease in the glassy component, and upon further loss of glass it passes into diabase. The pitchstone is largely an acid glass, surrounding crystals of quartz, and microlites of augite, feldspar, magnetite, etc. The author adds to the list of individualized components already known to exist in the rock hyalite and tridymite. The latter mineral occurs in plates aggregated into spherules and globules that surround quartz crystals, and the hyalite forms globules scattered here and there through the glass. The author thinks that materials of such widely different nature as that existing in these dykes could not have been formed by the differentiation of a magma after its intrusion into the dyke fissures, but that the differentiation must have taken place while the magma was still in its subterranean reservoir.

Analyses of Clays.—Hutchings³ quotes a series of analyses of carboniferous clays to show that these substances possess the requisite composition to become clay slates upon compression. He ascribes the small percentages of alkalis shown in most clay analyses to the fact

¹ Edited by Dr. W. S. Bayley, Colby University, Waterville, Maine.

² Quart. Jour. Geol. Soc., xlix, 1893, p. 536.

³ Geol. Magazine, Jan. and Feb., 1894.

that these analyses are of commercially valuable clays, selected for their small alkali contents. In the course of his article the author corrects some of the statements made in earlier papers and amplifies others. He declares that newly formed feldspar is present in the slates metamorphosed⁴ by the shap granite and in other contact slates. In the spots of the shap rocks, and in those of other contact slates, there is always present, in addition to its individual components, more or less of a yellowish-green very weakly polarizing substance in which the other components of the spot are imbedded. This is believed to possess an indefinite composition, and to be the result of aqueo-fusion of some of the constituents of the original rock and the solidification of the product in an amorphous condition. The paper concludes with a statement of the author's views concerning the transformations that rutile, biotite, quartz, feldspar, cordierite and other contact minerals undergo in cases of contact metamorphism.

The Phonolites of Northern Bohemia.—The phonolites of the Friedländer district of North Bohemia are nosean bearing trachytic phonolites and nepheline-phonolites, according to Blumrich.⁵ The latter contain phenocrysts of anorthoclase in a groundmass of sanidine, nepheline and aegerine crystals and groups of a new mineral which the author calls hainite. This hainite is a strongly refracting but a weakly doubly refracting colorless substance. It occurs in tiny triclinic needles with a density of 3.184. These unite into groups. It is found also as well-developed wine-yellow crystals forming druses in cavities in the rock. The mineral has a hardness of 5, and it is optically positive. It is supposed to be closely related to rinkite, hjortdahlite and the other fluorine bearing silicates common to the eleolite-syenites. In addition to hainite the druse cavities contain albite, chabazite and nosean. In the trachytic phonolites a glassy base was detected.

Spherulitic Granite in Sweden.—Loose blocks of spherical granite are reported by Backström⁶ from Kortfors, in Orebro, and Balungstrand in Dalekarlien, Sweden. The rock from Kortfors is a hornblende granitite containing concentric nodules composed of four zones. The inner one consists of oligoclase, microcline and quartz; the second of oligoclase in radial masses and small quantities of hornblende, biotite, magnetite, orthoclase and quartz; the third of hornblende, biotite, oligoclase and a little biotite, and the peripheral zone

⁴ Cf. *American Naturalist*, 1892, p. 245.

⁵ *Min. u. Petrog. Mitth.*, xiii, p. 465.

⁶ *Geol. Foren. i. Stockh. Förh.* 16, p. 107.

of magnetite in a matrix of oligoclase. The structure of the spheroids, with the younger minerals nucleally and the older ones peripherally distributed, indicates to the author that they were produced by liquation processes. The rock from Balungstrand possesses a coarse groundmass consisting almost exclusively of microcline and quartz. The spheroids are essentially oligoclase spherulites peripherally enriched by biotite. They are clearly older than the groundmass.

Diabase and Bostonite from New York.—A few dyke rocks cutting the gneisses of Lynn Mountain, near Chateaugay Lake, Clinton Co., N. Y., are described by Eakle⁷ as consisting of olivine diabase and of bostonite. The latter rock is porphyritic with phenocrysts of red orthoclase in a fine-grained groundmass with the trachytic structure. It differs from the other bostonites of the region in the presence of much chloritized augite in its groundmass. It is also more acid than these. Its analysis gave:

SiO ₂	Al ₂ O ₃	Fe ₂ O ₃	CaO	MgO	K ₂ O	Na ₂ O	Loss	Total
67.16	14.53	4.17	1.26	.41	6.10	5.55	1.10	= 100.28

The olivine diabase differs from the ordinary ophitic diabases in that much of its augite is in idiomorphic forms. They thus resemble Kemp's augite camptonites.

Petrographical News.—A very interesting series of analyses of rocks from the central and northeastern portions of the Mittelgebirge is given by Hibsche.⁸ The series includes analyses of phonolites, dolerites, camptonites, nepheline and leucite tephrites, augitites and basanites. Many of the rocks have been described in the literature.

Cohen⁹ has obtained from the Transvaal, Africa, specimens of a calcite bearing aplite and of a melilite augite rock of a somewhat abnormal character. The aplite is from the mine of the Iron Crown Gold Mining Co., near Hamertsburg, and the melilite rock from near Palabora. The melilite rock is a fine-grained aggregate composed largely of honey-yellow melilites and black augites. On its druse walls are little crystals of the first-named mineral, and through the druse cavities extend thin plates of copper. In the thin section, clear, colorless melilites, with rounded outlines and olive-green grains of augite are seen to lie in an opaque granular groundmass in which are dots and flakes of copper.

⁷ Amer. Geologist, xii, p. 31.

⁸ Min. u. Petrog. Mitth., xiv, p. 95.

⁹ Minn. u. Petrog. Mitth., xiv, p. 188.

Backström¹⁰ fused feldspathic phonolite and obtained as the product upon cooling a colorless glass filled with microlites of oligoclase, nepheline, small microlites of colorless pyroxene and tiny grains of picotite and olivine (?). Upon fusing a leucite phonolite, containing nosean, SO_3 is driven off and the resulting product is a glass enclosing microlites of oligoclase, a few prisms of nepheline and abundant crystals of a yellow pyroxene with the properties of aegerine.

¹⁰ Bull. d. l. Soc. Franc. d. Min., 1893, xvi, p. 130.